

*Subnuclear Components: Preparation and Fractionation*

Edited by G. D. Birnie

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The Editor of this book was previously responsible for the popular and well-thumbed 'Subcellular Components: Preparation and Fractionation' which has run to two editions so far. 'Subnuclear Components' is an extension of this approach and deals with the methodology of subnuclear fractionation in a critical and analytical way.

The first chapter, by E. A. Smuckler, M. Kopitz and D. E. Smuckler deals with methods for isolating nuclei. The chapter includes detailed tables listing essential details (such as homogenizing medium and centrifugation schemes) for isolating nuclei from a variety of lower eukaryotes, various invertebrates and amphibia, tissue culture cells, vertebrate organs and tissues and finally mammalian tumours. This is followed by an account by D. J. Fry of procedures for the isolation of nuclear envelopes. The article includes useful information on the morphology, chemical composition and enzymology of nuclear envelope preparations obtained by different techniques. Detailed flow-sheets for several isolation methods are included. U. E. Loening and A. M. Baker then describe the isolation of nucleoli from oocytes and a variety of preparations of isolated nuclei. Some typical methods are given and the fact is stressed that there is a 'multiplicity of modifications of methods'.

The preparation, characterization and fractionation of chromatin is then described by D. Rickwood and G. D. Birnie. Procedures for preparing chromatin from interphase and metaphase cells are described and the possible nuclear and cytoplasmic contaminants indicated. The chemical and physicochemical properties of the various chromatin preparations are given, together with an account of their template activity. The chapter also includes an extensive treatment of techniques for the fractionation, dissociation and

reassociation of chromatin. This chapter is then naturally followed by an account by E. W. Johns of the fractionation and isolation of histones. A useful method is given for the isolation and purification of the five major histone fractions from one calf thymus preparation, and there is also advice on the isolation of various individual histones. A. J. MacGillivray then gives a full account of non-histone proteins. Detailed tables include a list of biological activities detected in chromatin non-histone proteins, methods of preparation from 'dehistoned' chromatins and from dissociated but unsheared chromatins and amino acid composition data. M. E. Bramwell then describes the isolation of nuclear RNA. The inherent problems in such isolation are listed, various methods compared, and one (using Tween-80 and SDS) given in detail. Information is also given on the assessment of the degree of contamination, degradation and aggregation of nuclear RNA that had occurred. The last chapter, by P. H. W. Butterworth, deals with the isolation of DNA from eukaryotic cells. After a brief historical introduction and some account of procedures for assessing the size, intactness and purity of the DNA, three procedures are given in detail, with useful notes and advice on each stage.

'Subnuclear Components' is a worthy successor to its subcellular predecessor and is clearly essential reading for anyone contemplating a journey in the murky seas of nuclear methodology. The only obvious defect is the poor reproduction of many of the electron micrographs. Otherwise the text is a well presented, extensively annotated reference source that will be of great use in this rapidly developing field.

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